EXHIBIT A

A Survey of the Evidence on the Cost of Mutual Fund Flows

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1. *Introduction*

In response to a liquidity event, a fund manager faces two choices: trade or don't trade. Both involve costs on the order of 0.60% of the flow amount.

- **The costs of trading** are commissions and price impact (unfavorable trade execution vis à vis some "fair value" benchmark). Estimates from many studies – both academic and practitioner – put these costs (one-way) at about 0.50% - .80% (as a percentage of trading volume) for the typical institutional equity order. *See section 2 below*.

- **The cost of not trading** is random fluctuation in the portfolio cash position, due to the ebb and flow of shareholder transactions. This fluctuation imposes two costs on the fund: First, maintaining a significant average cash position to accommodate the fluctuations means a drag on performance, estimated to be in the 0.45% - 0.60% range (as a percentage of trading volume avoided). Second, the fund manager concedes market timing decisions to random outside forces because, left unattended, flow shifts the fund's cash position. Empirical studies show that this causes, on average, a drain on cash going into down markets and an overweighting on cash going into an up market; that is, it induces *negative* market timing performance. *See section 3 below*.

A third factor worth mentioning is taxes. While not a cost at the fund level, liquidity motivated trading can impose significant capital gains taxes on investors, taxes that would otherwise be deferred. While surely a real consideration, this cost is difficult to quantify as it requires knowledge of investor's marginal tax rates and the fund manager's alternative schedule for trading the stock.

Implication for the fund:

The typical fund faces a volume of investor flows to about 0.35% of assets each day, or two-thirds of assets per year. That translates into a 0.50% or so drag on performance, whether the fund trades on the flow or not. For the atypical fund it can mean substantially greater erosion of performance. For example, funds in the top quartile of flow volatility face a typical performance drag of about 1.2% per year.[1] To quote *Institutional Investor:*[2]

> "Transaction costs very easily can bleed a percentage point or two from a portfolio manager's returns," says Paul Davis, co-head of quantitative portfolio management and trading at CREF Investments, a division of $270 billion pension fund TIAA-CREF. "That can mean everything. It can be the difference between beating the market and not beating the market." And not beating the market can mean losing assets to competitors who do.

2. *The evidence on institutional trading costs*

The cost of a trade is both direct (out of pocket costs such as commissions and administrative expenditures) and indirect (the difference between the trade's execution price and some 'fair value' benchmark). The former is generally easy to quantify, the latter is more difficult.

Commissions paid by mutual funds are disclosed in the N-SAR filing and the Statement of Additional Information. A 1999 academic study of U.S. domiciled equity funds found that the average annual commission payment was 0.44% of fund assets, or 0.21% of traded volume. The Plexus Group estimates commission costs at 0.15% of traded volume using more recent data.

It is unclear what fraction of these payments are an actual cost rather than simply a soft-dollar purchase of goods and services. For instance, commission rates of about 5 cents a share are fairly common, whereas rates as low as 2 cents a share are available from discount brokers offering no research or other benefits. If half of all trades are done through a soft-dollar dealer, and half of the commission payments on those trades represent soft-dollar compensation, then the true cost of commissions is about 75% of the preceding estimates. Let us put the estimated cost of trading from commissions at 75%*16=12 basis points.

Bid-ask spread and price impact. There are many sources of estimates for these costs, both academic and practitioner. In fact, they come to broadly similar conclusions: for the large-cap stocks that institutions typically hold, the price at which a trade is executed is typically 40 to 70 basis points worse than a fair-value benchmark. For small to mid- capitalization stocks, this cost is on the order of 1.50% - 2.00% , or even higher.

Thus, a typical fund that sells a basket of large-cap stocks on Monday to meet redemptions and turns around and buys back a similar basket on Thursday generally pays about 1.10% more on Thursday than it received on Monday. Commissions bleed another 0.25%.

Academic literature on trading costs

Table 1 summarizes the recent academic literature on trading costs. Most of these studies focus on institutional trades, meaning transactions that are either large or specifically identified as an institutional trade. For the most part, they measure trading cost using price impact; i.e., a comparison of the transaction price to the pretrade price.

An important factor with institutional trading is the breaking up of an order into several trades. Much of the literature on trading costs looks at the cost of a single trade, one piece of the typical institutional order (which is broken up into pieces and executed over several days). This is an important distinction, as price-impact tends to accumulate as a trade package is worked. Suppose. for example, that a trade is broken into three 'releases,' and the price impact of each release is 0.15%. Then the total price-impact cost is

$$1/3 \ 0.15\%$$
$$1/3 \ 0.30\%$$
$$1/3 \ 0.45\%,$$

or a per-share average of 0.30%. If the market is able to sniff out a package being worked (as the evidence in [3] suggests), then the accumulated price impact of the impact of the second and third trade could be higher.

Several academic studies estimate these *accumulated* trade-cost measures, using proprietary data on the timing and price of each trade in a package. The cost estimated from these studies are substantially higher than the individual-trade estimates; averaging 0.90% or more for a one-way trade (excluding commissions).

The practitioner literature on trading costs

The practitioner literature confirms these estimates. For example, Institutional Investor reports (11/01/2001, see footnote 2) "the average cost of executing a trade declined from 73.2 basis points to 59.6 basis points from 1996 to 1998, according to Elkins/McSherry Co., a New York brokerage and trading consulting firm. Costs rose modestly overall in 1999, to 60.84 basis points."

The Plexus Group [2] estimates the accumulated cost (price impact on a per-trade basis plus what they call the delay cost, from accumulating orders over a trade package) at about 0.75%.

3. *Costs of not trading when investor flows shift the fund's cash balance*

that the matter should be given more attention. See [1], [4], [5] and [6].

First consider the cost of maintaining a significant cash balance. Suppose that the fund manager allows the cash balance to fluctuate between zero and five percent, maintaining an average 2.5% portfolio weight on cash. This cuts out about 85% of the liquidity motivated trading induced by flow.[3] Since the volume of flow averages 0.35% of assets per day, or about 88% of assets per year (assuming 250 trading days), a 5% buffer range on cash means avoiding a volume of trading equal to about three-quarters of fund assets per year. The performance drag is 0.23% per year; calculated as 0.025 cash times a 9.2% average equity-return premium. Allocating this cost over the trading volume saved, the cash-drag cost of not trading is around 0.30% (as a percentage of trading volume avoided).

This is somewhat less than the cost of trading, but it is only part of the story.

The market-timing performance of a fund is measured by the correlation between the fund's beta and market returns. Many studies spanning several decades have documented that this correlation is typically negative: fund betas tend to be relatively high in down markets and relatively low in up markets.[4] See [1], [5] and [7] – [11]. While perverse, this evidence is sufficiently strong to leave little doubt: *something* has a materially adverse impact on assessed timing performance.

That something is flow. Flow affects a fund's market timing because it directly affects the fund's cash position. Empirical studies [1] show that flow tends to drain cash going into down markets and tends to inflate cash going into up markets. The effect on market timing can be determined by simply controlling for flow when examining the correlation between the fund's beta and market returns. The result is striking: while the average fund exhibits statistically reliable negative timing, *all* of it can be attributed to flow. The average fund manager's discretionary market-timing performance, after scrubbing out the effects of flow, is positive. Thus, the 0.45% - 0.60% estimate of the cost of a cash drag understates the true cost of *not trading* in response to flow.

Table 1 Academic Studies of Execution Costs, estimates in units of percentage of traded dollar volume

Article	Date	Type of trade	Estimate large-cap stocks	Estimate small-mid cap	Measure
Studies of the cost of a single trade (each is likely just a component of a trade package*)					
Bessimbinder & Kaufman, Journal of Financial & Quantitative Analysis, vol 32 no 3.	1997 1997	all traders all traders	0.25% 0.20%	0.60% - 0.90% 0.50% - 0.80%	Effective spread Price impact
Bessimbinder, Working Paper, Emory University	2000 2000	all traders all traders	0.22% 0.15%	0.60% - 0.90% 0.40% - 0.65%	Quoted spreads Price impact
Madhavan, Richardson & Roomans, Review of Financial Studies, vol 10, no 4	1997 1997	institutional institutional	0.14% 0.15%-0.20%	- -	Implied spread Price impact
Madhavan & Cheng, Review of Financial Studies, vol 10, no 1	1997	institutional	0.15% - 0.20%	-	Price impact
Jones & Libson, Journal of Financial Intermediation, 8	1999	institutional	-	0.60% - 1.10%	Price impact
Chen, Stanzl & Watanabe, Working Paper, Yale University	2001	institutional	0.15% - 0.20%	0.50% - 1.20%	Price impact
Studies of the accumulated cost of a trade package* (the portfolio manager's collective order, observing that it is broken up into several trades)					
Keim & Madhavan, Review of Financial Studies, vol 9, no 1	1996	institutional	1.80% - 3.00%		(see comment)
Chan & Lakonishok, Journal of Finance, vol 52, no 2	1997	institutional	0.90%	1.50% - 3.00%	
		(comment: market-cap is less clear and the packages are somewhat larger than typical)			

*Each order from the portfolio is typically released as two to five individual trades over a period of 1.8 - 2.5 days, see Chan & Lakonishok, 1997 and Keim & Madhavan JFE.

The effective spread is the difference between the trade price and the preceding quote midpoint. The implied spread is an estimate of that from more complex statistical analysis. Price impact is similar to the effective spread in that it measures the execution price relative to preceding prices, though not necessarily the immediately preceding price.

1 Computed from daily flow data provided by TrimTabs, Inc., as follows: (1) calculate on a fund-by-fund basis the average absolute daily flow over the period 1998 - 2001 for 450 equity funds. (2) rank order and take those funds in the top quartile. (3) compute the average daily flow for those funds; equal to 0.83%.

2 Justin Schack, Nov 1, 2001 "Trading," Institutional Investor, vol 35, issue 11, pg.95.

3 This is the average percentage reduction in residual flow from a simulation on the daily flow provided by TrimTabs, Inc., involving 450 equity funds over the period 1998 - 2001.

4 Note: a cash position in a down market helps a fund beat its benchmark, no question. The issue here is does the fund tend to have a larger or smaller cash balance, on average, going into a down market? The answer is "smaller." That is what we mean by negative market timing.

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